

CLAIMS

What is claimed is:

1. A passive water management system for a fuel cell power plant (10), the system comprising:

- 5 a. at least one fuel cell (12) for generating electrical current from hydrogen containing reducing fluid fuel and oxygen containing oxidant reactant streams, the fuel cell (12) including an anode fuel flow field (14), and a cathode oxidant flow field (16) defined adjacent opposed sides of an electrolyte (18),
10 an anode water management flow field (20) defined adjacent the anode fuel flow field (14), the anode fuel flow field (14) (100) including at least one fuel path (102) defined between a fuel inlet (108) and a fuel outlet (110) for directing the fuel to flow adjacent
15 to the electrolyte (18) from the fuel inlet (110) through the fuel path (102) to the fuel outlet (110);
- 20 b. a cooler plate (52) secured in heat exchange relationship with the fuel cell (12) for removing heat from the fuel cell (12), the cooler plate (52) (118) including at least one coolant path (120) defined between a coolant inlet (126) and a coolant outlet (128) for
25 directing a cooling fluid to flow from the coolant inlet (126) through the coolant path (102) to the coolant outlet (128); and,
- 30 c. wherein a width (132) of the fuel path (102) is about the same as a width (134) of the coolant path (120) where the fuel path (102) and coolant path (120) are closest to each other, and the fuel path (102) extending between the fuel inlet (108) and the fuel outlet (110)

35 substantially overlies the coolant path (120)
extending between the coolant inlet (126) and
the coolant outlet (128) to minimize a
temperature differential between fuel flowing
through the fuel path (102) and the closest
cooling fluid flowing through the coolant path
40 (120).

2. The system of claim 1, further comprising a
plurality of fuel paths (102) extending between the
fuel inlet (108) and the fuel outlet (110) of about
the same width as and substantially overlying a
5 corresponding plurality of coolant paths (120)
extending between the coolant inlet (126) and the
coolant outlet (128).

3. The system of claim 1, further comprising a coolant
loop (54) for circulating a cooling fluid through
the cooler plate (52), the coolant loop including a
pressure control means (68) for controlling a
5 pressure of the cooling fluid within the cooler
plate (52) to be below a pressure of the reactant
streams within the anode fuel flow field (14) and
cathode oxidant flow field (16) of the fuel cell
(12).